F&eIT Series

RS-422 Ethernet Media Converter

RP-422(FIT)GY

User's Manual

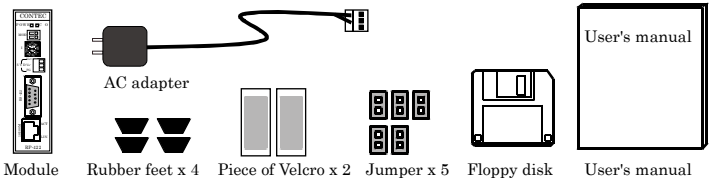
CONTEC CO.,LTD.

Check Your Package

Thank you for purchasing the CONTEC product.
The product consists of the items listed below.
Check, with the following list, that your package is complete. If you discover damaged or missing items, contact your retailer.

Product Configuration List

- RP-422(FIT)GY...1
- AC Adapter with 1.8m cable...1
- Rubber feet...4
- Piece of Velcro...2 set
- Jumper...5
- Floppy disk...1
- User's manual (this booklet)...1



Copyright

Copyright 2004 CONTEC CO., LTD. ALL RIGHTS RESERVED
No part of this document may be copied or reproduced in any form by any means without prior written consent of CONTEC CO., LTD.

CONTEC CO., LTD. makes no commitment to update or keep current the information contained in this document. The information in this document is subject to change without notice.

All relevant issues have been considered in the preparation of this document. Should you notice an omission or any questionable item in this document, please feel free to notify CONTEC CO., LTD.

Regardless of the foregoing statement, CONTEC assumes no responsibility for any errors that may appear in this document nor for results obtained by the user as a result of using this product.

Trademarks

F&eIT is a registered trademark of CONTEC CO., LTD. Other company and product names mentioned herein are generally trademarks or registered trademarks of their respective owners.

Table of Contents

Check Your Package i
Copyright ii
Trademarks ii
Table of Contents iii

1. Before Using the Product 1

About the Module 1
Features 1
Customer Support 2
Web Site 2
Limited One-Year Warranty 2
How to Obtain Service 2
Liability 2
Safety Precautions 3
Safety Information 3
Handling Precautions 4
Environment 5
Inspection 5
Storage 5
Disposal 5

2. Module Nomenclature and Settings 7

Nomenclature of Module Components 7
LED Indicator 7
MODE Switch 8
ID Switch 9
Input-Output Interface 10

3. Explanation in Mode of Operation 11

Through Mode 11
Modem Mode 12
Virtual COM Mode 13
Terminal Mode 13

4. Installation and Connection 15

Installation Method ... 15
Mounting on a DIN Rail ... 15
Table Top Installation ... 18

Connection ... 18
Cable Connection ... 18
Connection of a Power Supply ... 19
Connection with RS-422 device ... 20

Setup of RS-422 Interface ... 21

5. Setup 23

Setup Procedures ... 23

Utility Software ... 24
Preparation of Utility Software ... 24
Starting of Utility Software ... 24
Connection Environment ... 26
Node Registration ... 28
Configuration ... 29
File Management ... 36
Status ... 37
Communication Test ... 41

Modem command ... 44
(1) @RAR ... 45
(2) @CAB ... 45
(3) @RBS ... 46
(4) @INI ... 46
(5) @RSD ... 47
(6) @RSE ... 47
(7) @CRB ... 47
(8) @RRG ... 47
(9) @RST ... 48
(10) @CTB ... 48
(11) @VER ... 48
(12) @TXT ... 48
(13) @TXB ... 49
(14) @TXE ... 49
(15) @TXU ... 49
(16) @RXT ... 50
(17) @RXB ... 50
(18) @RXE ... 50
(19) @RXU ... 51
(20) @RXN ... 51
(21) @PIG ... 52
(22) @ECO ... 52

(23) @SAV 52
(24) @RES 53
(25) @RRT 53
Setup of a virtual COM driver 54
Correspondence OS 54
Cautions on Use 54
Installing the Driver in Windows XP 55
6. SNMP Agent Functions 57
SNMPc Overview 57
MIB Support 57
Control Using SNMPc 58
Building-in to SNMPc 59
MIB Database Updates 59
7. Troubleshooting 61
When Communication Fails 61
When SNMP Connections Fail 61
When the RP-422(FIT)GY Will Not Start 61
If your problem cannot be resolved 61
8. Appendix 63
System Reference 63
Product Specifications 63
External Dimensions 64
Memory register 65

1. Before Using the Product

This chapter provides information you should know before using the product.

About the Module

The RP-422(FIT)GY is a media converter for converting between RS-422 serial and Ethernet interfaces.
The media converter can serve as a virtual COM port of a Windows PC to remotely control an RS-422 device (in the virtual COM mode).
The media converter can replace an RS-422 cable connection between devices with an Ethernet connection without changing the application (in the transparent mode).
By setting IDs for each device, communications can be controlled using commands (modem mode).
Please read this manual carefully before performing system configuration such as setting switches or connecting to external devices.

Features

- Connects RS-422 devices via a wired LAN (Ethernet).
- Capable of communication with the wireless RS-422 adapter (RP-422(FIT)GY as a 11M wireless LAN version of the RP-422(FIT)GY) in the 11M wireless LAN FLEXLAN-DS110 series and of controlling mobiles in combination with a wireless LAN system.
- Support for RS-422 full-duplex transmissions.*1
- RS-422 supports up to 921.6kbps *2
- The wired LAN can be 10BASE-T or 100BBASE-TX
- Simple Network Management Protocol (SNMP) integrated, capable of remote monitoring using SNMP compliant network management software such as SNMPc (option).
- Easy setup using the ID switch and MODE switch
- Utility software bundled, which can easily read/write settings, update firmware, and display status information.
- Like other F&eIT series products, a 35mm DIN rail attachment is fitted to the module as a standard feature.

*1 Not supporting half-duplex communication (only a Tx pair as signal conductors)
*2 Restrictions apply depending on the cable length and the device with which you are communicating.

Customer Support

CONTEC provides the following support services for you to use CONTEC products more efficiently and comfortably.

Web Site

Japanese http://www.contec.co.jp/
English http://www.contec.com/
Chinese http://www.contec.com.cn/

Latest product information

CONTEC provides up-to-date information on products.
CONTEC also provides product manuals and various technical documents in the PDF.

Free download

You can download updated driver software and differential files as well as sample programs available in several languages.

Note! For product information

Contact your retailer if you have any technical question about a CONTEC product or need its price, delivery time, or estimate information.

Limited One-Year Warranty

CONTEC F&eIT products are warranted by CONTEC CO., LTD. to be free from defects in material and workmanship for up to one year from the date of purchase by the original purchaser.
Repair will be free of charge only when this device is returned freight prepaid with a copy of the original invoice and a Return Merchandise Authorization to the distributor or the CONTEC group office, from which it was purchased.
This warranty is not applicable for scratches or normal wear, but only for the electronic circuitry and original products. The warranty is not applicable if the device has been tampered with or damaged through abuse, mistreatment, neglect, or unreasonable use, or if the original invoice is not included, in which case repairs will be considered beyond the warranty policy.

How to Obtain Service

For replacement or repair, return the device freight prepaid, with a copy of the original invoice. Please obtain a Return Merchandise Authorization number (RMA) from the CONTEC group office where you purchased before returning any product.

* No product will be accepted by the CONTEC group without the RMA number.

Liability

The obligation of the warrantor is solely to repair or replace the product. In no event will the warrantor be liable for any incidental or consequential damages due to such defect or consequences that arise from inexperienced usage, misuse, or malfunction of this device.

Safety Precautions

Understand the following definitions and precautions to use the product safely.

Safety Information

This document provides safety information using the following symbols to prevent accidents resulting in injury or death and the destruction of equipment and resources. Understand the meanings of these labels to operate the equipment safely.

⚠ DANGER	DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.

Handling Precautions

⚠ CAUTION

- Do not modify the module. CONTEC will bear no responsibility for any problems, etc., resulting from modifying this module.
- Do not use or store the equipment in a hot or cold place, or in a place that is subject to severe temperature changes.(Operating temperature range: 0 to 50°C)
- Do not use or store the equipment in a place subject to direct sunlight or near a heating device, such as a stove.
- Do not use or store the equipment in a dusty or humid place.
  (Operating humidity range: 10 to 90%RH, no condensation)
- As this product contains precision electronic components, do not use or store in environments subject to shock or vibration.
- Do not use or store the product near equipment generating a strong magnetic field or radio waves.
- If you notice any strange odor or overheating, please unplug the power cord immediately.
- In the event of an abnormal condition or malfunction, please consult the dealer from whom the equipment was purchased.
- To avoid electric shock, please do not touch the system with a wet hand.
- To prevent damage, please do not subject the unit to impact or bend it.
- To prevent contact malfunction, please do not touch the metallic pins on the external module connector.
- The module contains switches that need to be properly set. Before using the module, please check its switch settings.
- To avoid malfunction, please do not change the module switch settings in an unauthorized manner.
- Clean the RP-422(FIT)GY by wiping lightly with a soft cloth moistened with water or a cleaning solution. Take care to avoid the use of benzene, thinners or other volatile solutions which may cause deformation or discoloration.

Environment

Use this product in the following environment. If used in an unauthorized environment, the module may overheat, malfunction, or cause a failure.

Operating temperature

0 to 50°C

Operating humidity

10 to 90%RH (No condensation)

Corrosive gases

None

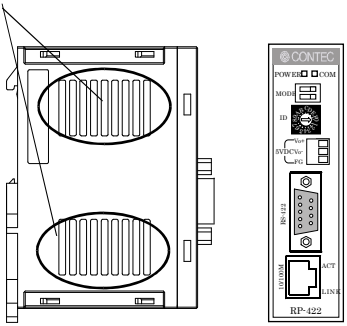
Floating dust particles

Not to be excessive

Inspection

Inspect the product periodically as follows to use it safely.

- Check that the ventilation slit has no obstruction and has no dust or foreign matter adhering.



Storage

When storing this product, keep it in its original packing form.

(1) Put the module in the storage bag.
(2) Wrap it in the packing material, then put it in the box.
(3) Store the package at room temperature at a place free from direct sunlight, moisture, shock, vibration, magnetism, and static electricity.

Disposal

When disposing of the product, follow the disposal procedures stipulated under the relevant laws and municipal ordinances.

2. Module Nomenclature and Settings

Nomenclature of Module Components

Figure 2.1 shows the names of module components. In the figure, the indicated switch settings represent factory settings.

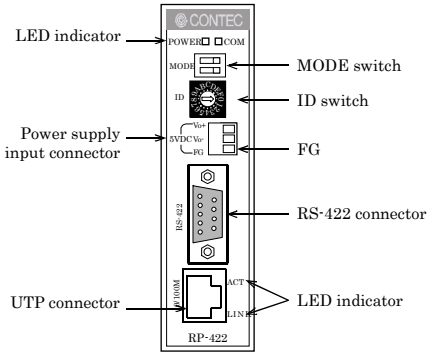


Figure 2.1. Nomenclature of Module Components

⚠ CAUTION

Do not block the ventilation vents as this may result in damage or malfunction due to overheating.

LED Indicator

Table 2.1. LED Display

- During normal operation

Name	Status	Indicator
POWER	Flashing	Startup, or startup error
	On	Operating
COM	Flashing	Sending or receiving COM data

- Others

Name	Status	Indicator
POWER	Flashing 2 times	Initialization error
	Flashing 3 times	Firmware writing error
POWER COM	All flashing at the same time	Firmware writing in progress

MODE Switch

This sets or initializes the operating mode for the RP-422(FIT)GY. The factory default setting is that the MODE switch setting is used and all switches are set to OFF.

You can use the MODE switch to change the operating mode from the factory default setting to your desired mode.

For detailed settings, use the utility software or setup the module from a terminal.

* Note that the meaning of the MODE switch settings differ depending on the ID switch settings.

Table 2.2. MODE Switch

- ID switch < Case of 0 to E>

<table>
<tr><th colspan="2">Item</th><th>Description</th></tr>
<tr><td>1, 2</td><td>MODE</td><td>Set the operating mode
<table>
<tr><th>SW1</th><th>SW2</th><th>Mode of operation</th></tr>
<tr><td>OFF</td><td>OFF</td><td>Selected in "Through Mode".</td></tr>
<tr><td>OFF</td><td>ON</td><td>Selected in "Modem Mode".</td></tr>
<tr><td>ON</td><td>OFF</td><td>Selected in "Virtual COM Mode".</td></tr>
<tr><td>ON</td><td>ON</td><td>Not used</td></tr>
</table></td></tr>
</table>

- ID switch < Case of F>

Item		Description
1	INIT	Restore the RP-422(FIT) to its factory default settings. When this switch is ON, the POWER and COM LED's start to blink. Turning the switch OFF while the LEDs are still blinking (approx. 3 seconds) restores all settings to their factory default values when the module is next restarted. * Wait until the POWER and COM LEDs have gone back to their normal states before rebooting or turning off the power.
2	--	Not used

ID Switch

This sets the device ID for the RP-422(FIT)GY.

The setting range is 0 to E (0 to 14), but the ID can be set in the range 0 to 254 by software.

Note that device ID F (15) means “Terminal Mode”.

The factory default setting is that the ID switch setting is used and the device ID is set to “0”.

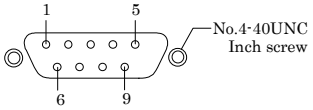
Figure 2.2. ID Switch

0 to E	:	Device Number
F	:	Changes to terminal mode. Set the device to terminal mode to use the utility software to perform maintenance on the RP-422(FIT)GY via a COM connection or when using modem commands with “echo back” enabled.

Input-Output Interface

RS-422 Connector

Table 2.3. RS-422 Port Pin Assignments

Connector	D-SUB 9 pin (Male)			
				
Pin No.	Abbreviated name	Signal name	Input-Output	Note
1	SG	Signal Ground	---	
2	RTS+	Request to Send	Output	
3	RTS-		Output	
4	TxD+	Transmit Data	Output	
5	TxD-		Output	
6	CTS-	Clear to Send	Input	
7	CTS+		Input	
8	RxD+	Receive Data	Input	
9	RxD-		Input	

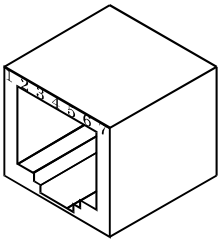
Ex. Applicable connector

17JE-13090-02(D8C)[DDK, F(Female)type]

UTP connector

Table 2.4. UTP Port Pin Assignments

Pin No.	Signal
1	TD+
2	TD-
3	RD+
4	Not used
5	Not used
6	RD-
7	Not used
8	Not used



3. Explanation in Mode of Operation

Through Mode

This mode transfers data directly from the RS-422 device connected to the RP-422(FIT)GY to the RP-422(FIT)GY with the same device ID or with the specified device ID. This means communications can be performed in the same way as if the 1-to-1 connection via an RS-422 cable has been replaced with a wired network.

Existing applications that operate using RS-422 can continue to be used without any changes.

However, the RS-422 parameters of the RP-422(FIT)GY and the connected device must be the same.

You can use the utility software to specify the device ID of the other RP-422(FIT)GY (opposing device ID).

⚠ CAUTION

- If using broadcasting, ensure that all RP-422(FIT)GY units have different device IDs.
- Device ID 255 is reserved for broadcast use.
- To avoid any adverse effects on other LAN devices, set the IP address, subnet mask, and other network parameters to appropriate values.
- Although, existing application can generally continue to be used unchanged, note that they may not operate correctly if particular RS-422 control procedures are used (see below).

  (Example) - Baud rate changed during operation

  - Hardware signals used for proprietary purposes other than flow control

  - RI signal used

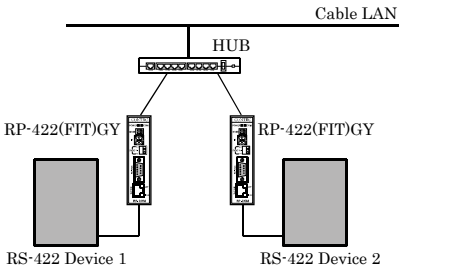


Figure 3.1. Through Mode

Modem Mode

This mode performs RS-422 communications on a packet-by-packet basis using special commands to control the RP-422(FIT)GY. As the device ID is added to the transmitted packet data, communication can be performed with multiple RP-422(FIT)GY devices.

As operation is controlled by commands, the device connected to the RS-422 port of the RP-422(FIT)GY requires special application software. Also, the type of data being sent or received can be identified as either text data, binary data, Ethernet data, or UDP/IP data. In particular, UDP/IP data can be used to communicate directly with a Socket interface on a host PC.

The following three types of communication are supported.

(1) Communication with a specified device ID
Communication can be performed between RS-422 devices connected to RP-422(FIT)GY units.

(2) Communications with UDP/IP Socket
This can be used to communicate with Windows PCs or workstations on the LAN.

(3) Build and transmit or receive Ethernet frames
This can be used to communicate with LAN devices that use a protocol other than UDP/IP.

⚠ CAUTION

- Ensure that the specified device IDs are unique
- Device ID 255 is reserved for broadcasting.
- To avoid any adverse effects on other LAN devices, set the IP address, subnet mask, and other network parameters to appropriate values.

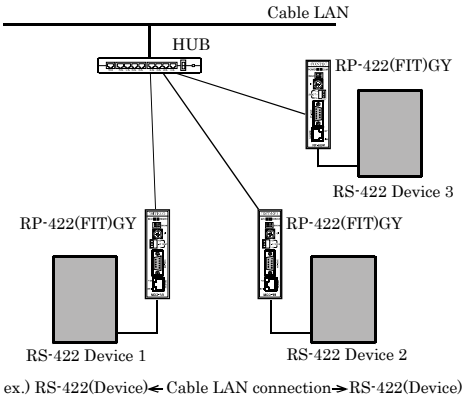


Figure 3.2. Modem Mode

Virtual COM Mode

Virtual COM driver mode for Windows converts COM data to LAN data to control the RS-422 port on an RP-422(FIT)GY via the LAN. This has the effect of extending a 1-to-1 RS-422 cable connection to operate via the LAN and allows existing applications that use RS-422 to continue to be used changed.

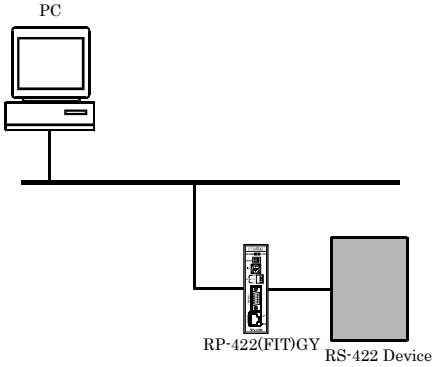


Figure 3.3. Virtual COM Mode

⚠ CAUTION

To avoid any adverse effects on other LAN devices, set the IP address, subnet mask, and other network parameters to appropriate values.

Terminal Mode

This mode is used to access the RP-422(FIT)GY via the RS-422 port to perform maintenance using the utility software or modem commands.

Setting the ID switch to “F” forcibly sets the RP-422(FIT)GY to terminal mode.

When set to terminal mode, the RS-422 settings are as follows.

- Baud rate : 9600bps
- Data bit : 8bit
- Parity : None
- Stop bit : 1bit
- Flow control : Hardware

⚠ CAUTION

To reboot a device from terminal mode, restore the previous ID switch settings, then turn the power off then on again.

4. Installation and Connection

Installation Method

Mounting on a DIN Rail

Mounting procedure

(1) Pushing the fixing hook with a flat-blade screwdriver renders it into a lock-enabled condition (this operation should be done on all connected modules).

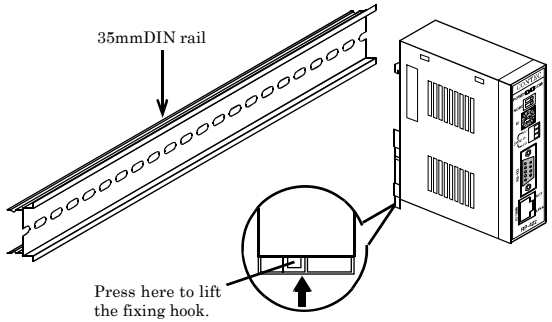


Figure 4.1. Mounting on a DIN Rail < 1 / 3 >

(2) Hook the unit (an object consisting of a controller and a module) from the upper part of the DIN rail, and press the lower part of the unit onto the DIN rail.

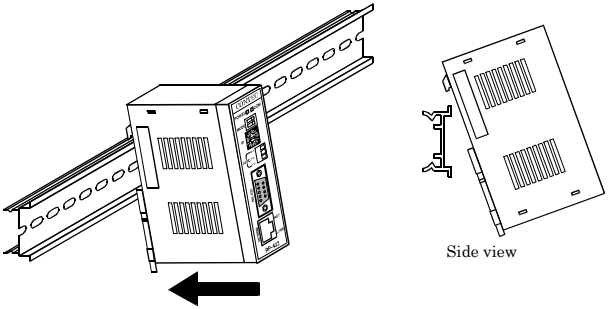


Figure 4.1. Mounting on a DIN Rail < 2 / 3 >

(3) The fixing hook is automatically locked, and the module can be mounted in one-touch.

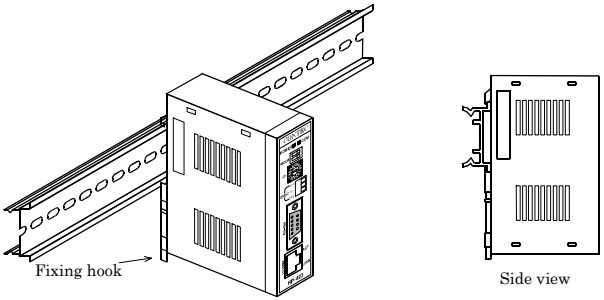


Figure 4.1. Mounting on a DIN Rail < 3 / 3 >

Removal procedure

(1) Lower the fixing hook for the unit to unlock it (this operation should be performed on all connected modules).

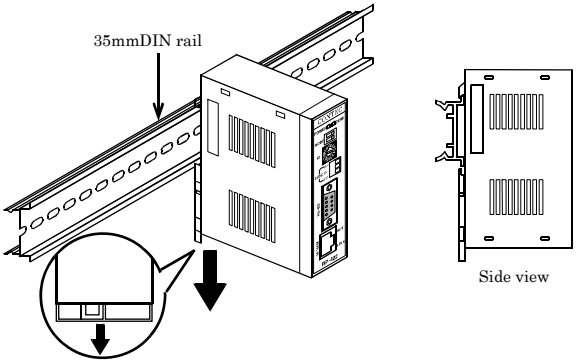


Figure 4.2. Removing the Module from the DIN Rail <1 / 3 >

(2) With the fixing hook unlocked, pull the lower part of the unit toward you.

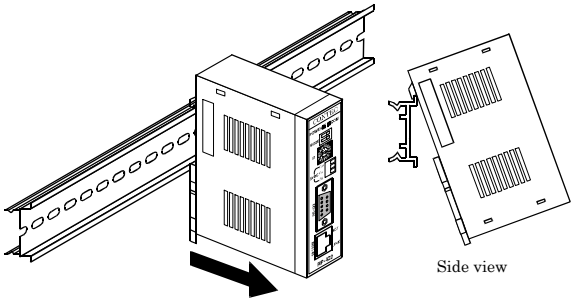


Figure 4.2. Removing the Module from the DIN Rail < 2 / 3 >

(3) By lifting the unit, you can easily remove it from the DIN rail.

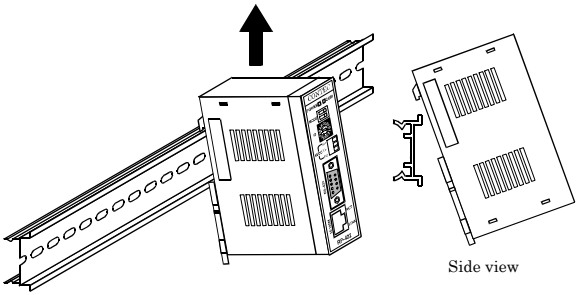


Figure 4.2. Removing the Module from the DIN Rail < 3 / 3 >

Table Top Installation

Use the rubber pads included with the unit.

To install on a table top, choose a sturdy, level surface with a well-ventilated space (approx. 5cm.) in all directions.

⚠ CAUTION

Do not obstruct the ventilation slits. This can cause the temperature inside the product to rise and can damage the components inside.

Connection

Cable Connection

Connect the UTP connector to the UTP cable.

Network cable

Cables complying with the following specifications should be used:

Category 3, 4, 5 UTP cable (for 10BASE-T)

Category 5 UTP cable (for 100BASE-TX)

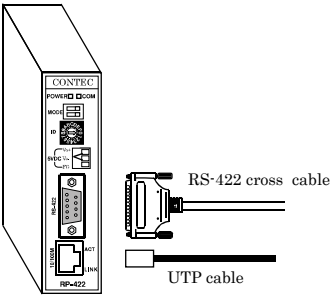


Figure 4.3. Cable Connection

Connection of a Power Supply

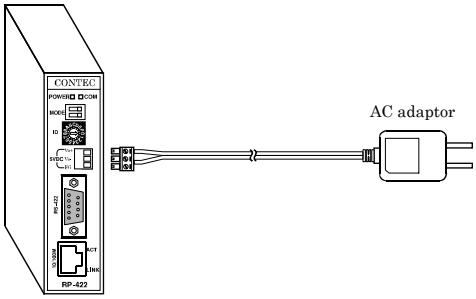
Connect the supplied AC adapter to the power input connector.

You can also connect a power supply unit (sold separately) (POW-DD10GY, POW-AD22GY, or POW-AD13GY). To connect a power supply unit to the RP-422(FIT)GY, connect the cable to the removable connector on the unit or module face. (Compatible cables: AWG 28 to 16)

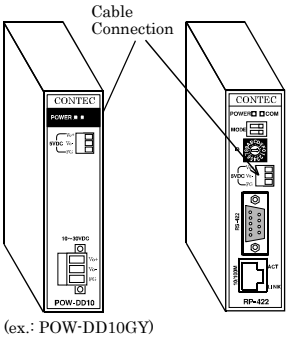
⚠ CAUTION

Because the power supply unit generates heat, a minimum spacing of 2.cm should be provided between the RP-422(FIT)GY and any adjoining units, and care should be taken so that the ventilation holes are not covered.

<An appending AC adapter is used>



<An optional power supply unit is used>



(ex.: POW-DD10GY)

Figure 4.4. Connection of a Power Supply

Connection with RS-422 device

Connection of Cable

Examples of cable connection to the RP-422(FIT)GY are illustrated below.
Transmission via the RS-422 interface is a differential method in which two-wire (+, -) relative potential differences are meaningful as signals. You should use a shielded twisted pair cable (balanced line) to improve noise immunity.

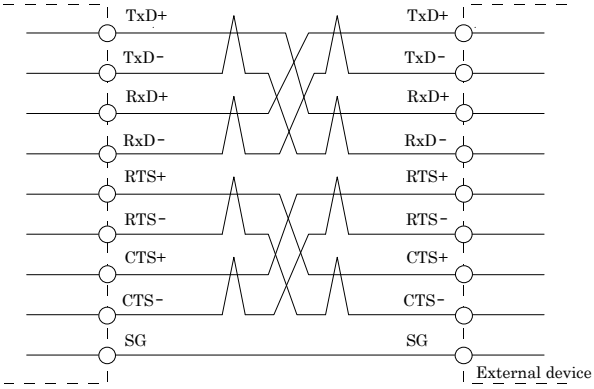


Figure 4.5. Example Connection RTS and CTS to a External Device

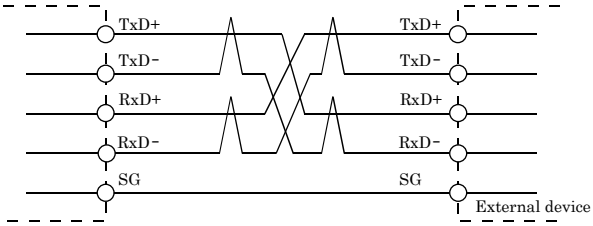


Figure 4.6. Example Connection Oneself loop to RTS and CTS

⚠ CAUTION

Do not connect pins 9-10 and pins 11-12 at the same time. Doing so may cause a fault.

Setup of RS-422 Interface

Use the JP4 to set the terminal resistor and operation mode of the RS-422 interface.

To access the JP4, you need to remove the top lid of the RP-422(FIT)GY. See Figure 4.9 for removing the top lid.

Set the terminal resistor (terminator) to match the device connected. The RP-422(FIT)GY contains a 120-ohm resistor for termination. For party-line connection, configure the bus topology so that only the input signals of the devices located at its ends have a terminal resistor. To set the terminal resistor to a value other than 120Ω, set the JP4 for the state “no terminal resistor inserted” and insert an external terminal resistor.

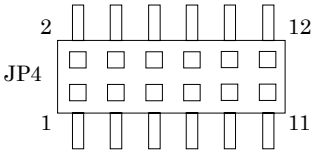


Figure 4.7. Magnified figure of JP4

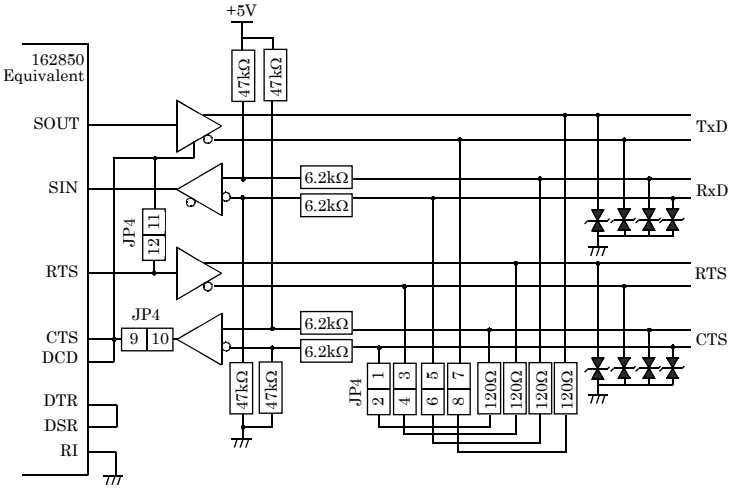


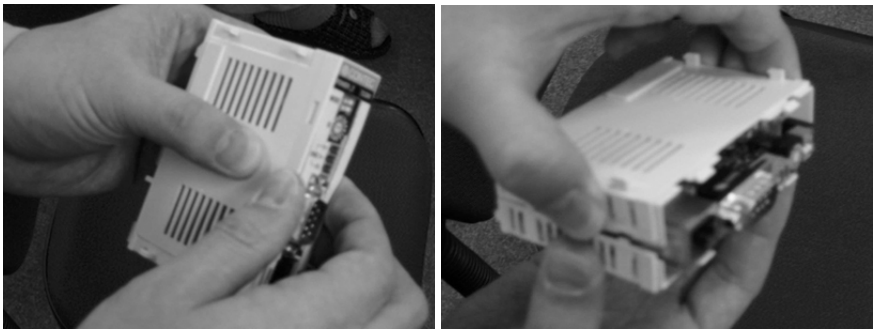
Figure 4.8. Circuitry Diagrams

Table 4.1. Setup of RS422 interface

	Pin No.	Description	Factory setting
Terminal resistor	1 , 2	Connecting pins 1-2 inserts a terminal resistor between CTS+ and CTS-.	Open
	3 , 4	Connecting pins 3-4 inserts a terminal resistor between RTS+ and RTS-.	Open
	5 , 6	Connecting pins 5-6 inserts a terminal resistor between RXD+ and RXD-.	Open
	7 , 8	Connecting pins 7-8 inserts a terminal resistor between TXD+ and TXD-.	Open
Operating	9 , 10 11,12	Connect RTS and CTS to the remote device. 9-10: Short, 11-12: Open Cause RTS and CTS to loop themselves. 9-10: Open, 11-12: Short	9-10: Short 11-12: Open

⚠ CAUTION

Do not connect pins 9-10 and pins 11-12 at the same time. Doing so may cause a fault.



Remove the front panel while holding the main part of the casing.

Remove the upper part of the casing while holding.

Figure 4.9. Disassembling the Casing

5. Setup

Setup Procedures

Simple setup procedure (Only MODE switch and ID switch)

(1) Use the MODE switch to set the operating mode.
(2) Use the ID switch to set the device ID (0 to 14).
If using through mode, set the same ID as the opposing unit. If using modem mode, set an ID that is not used by any other unit.
(3) Restart
* This uses the factory defaults for all settings other than the operating mode and device ID. See the utility software explanation later in this manual for details of what these settings are.

Advanced setting procedure (Using the utility software)

(1) Use “Connection Environment” to select the device and specify how to connect.
(2) If you specify a COM connection, set the ID switch to “F” to set terminal mode.
(3) Create the device list by using “Node Registration” to perform an automatic search or by adding new device entries.
(4) Use “Node Name” in “Configuration” to select the name or address of the device you wish to setup.
(5) If modifying settings on an existing device, use the [Read] button to read the current settings.
(6) Set the desired items.
(7) When you have finished modifying the settings, use the [Write] button to save the settings.
(8) Use the [Reboot] button to reboot the device.
As you cannot perform a reboot from the utility software if using a COM connection, set the ID switch back to its original position, then turn the power off then on again.
* Once you have performed steps (1) and (3), you do not need to repeat them each time unless there have been some changes.

Advanced setting procedure (Using modem commands from a terminal)

(1) Set the ID switch to “F” to set terminal mode.
The RS-422 settings are preset to 9,600bps, 8 data bits, no parity, 1 stop bit, and hardware flow control. Keyboard input is echoed back.
(2) Use the @RRG command to modify settings (memory registers).
(3) When you have finished changing settings, use the @SAV command to save the settings.
Use the @RES command if you wish to apply the new settings temporarily without saving.
(4) Set the ID switch back to its original position, then turn the power off then on again.

⚠ CAUTION

Maintenance via the RS-422 port on the RP-422(FIT)GY requires RS-422 driver software available separately from this product.

Utility Software

This is a Windows application for detecting devices on the network, reading and writing setup data, upgrading firmware, and displaying status information.
These maintenance operations can be performed from a Windows PC via either the LAN or COM port.

⚠ CAUTION

Maintenance via the RS-422 port on the RP-422(FIT)GY requires RS-422 driver software available separately from this product.

Preparation of Utility Software

(1) Insert the floppy disk (provided) in the A: drive of the computer.
(2) Open the Explorer.
(3) Use Explorer to copy the file 'XCOMUTIL.EXE' from the floppy disk to the appropriate directory.
Example: C:\LANUTIL\

Starting of Utility Software

Double click on the XCOMUTIL.EXE file to open the Access Point Maintenance Utility.
You will see the following main menu.

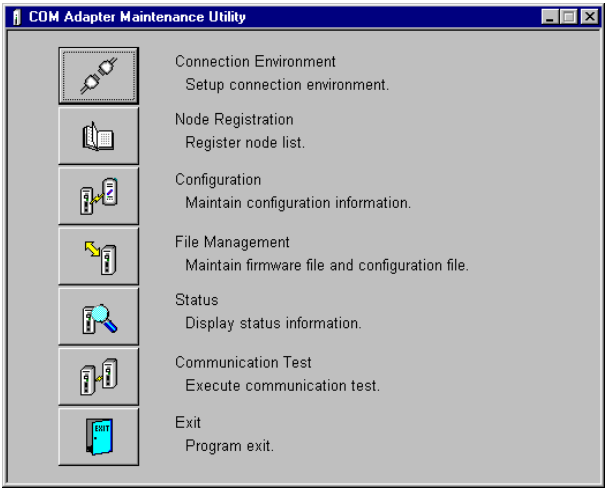


Figure 5.1. Main Menu

Connection Environment

This sets up the utility software. These settings need to be set before you can perform maintenance operations.

Node Registration

Edits the access point name list.
This list is used to detect devices connected by wired or wireless connection. Device names are added or deleted using the edit function.

Configuration

Maintains configuration information.
View or enter settings for the selected devices.

File Management

Used for firmware maintenance.
View firmware version, or write firmware.

Status

Displays access point information.
View and verify information about the selected device.

Communication Test

Performs a simple communications test.

Exit

Program exit.

Connection Environment

This specifies the setup data used by the utility software to perform device maintenance.
These settings are required to setup communications between the utility software and the network devices. You must set these settings before performing operations such as registering devices using an automatic search, setting up devices, upgrading firmware, or displaying status information.

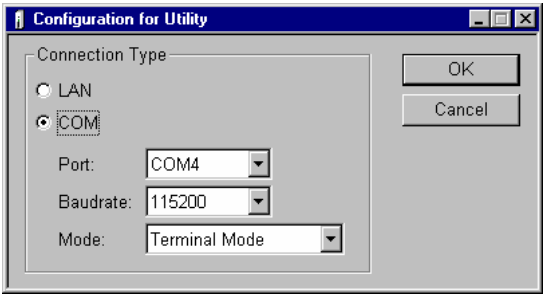


Figure 5.2. Connection Environment

Parameter	Description
LAN	Perform device maintenance via the LAN port.
COM	Perform device maintenance via the COM port.
Port	Select the COM port name on the Windows PC.
Baudrate	Set the communication speed.
Mode	Select the operating mode of the connected device.

Settings table for using the COM port

RP-COM(FIT)GY	Utility software		
	Mode		Baudrate
	Terminal Mode	Modem Mode	
Modem Mode	O	O	Set same value as set on device
Through Mode	O	x	Set values that permit communications on both sides
Virtual COM Mode	O	x	

O: allowed, x: not allowed

⚠ CAUTION

- To use terminal mode, the ID switch on the device must be set to “F”.
- When using modem mode, if the RS-422 settings (data bits, parity, and stop bits) on the device are different to those listed below, use terminal mode to modify the settings.

Parameter	Setting value
Data bit	8 bit
Parity	None
Stop bit	1 bit
Flow control	Hardware

Node Registration

This registers data for the devices on the network. Maintenance operations such as changing settings or upgrading the firmware are performed based on the data registered here. You must always perform node registration

Assigning names to the devices found by the automatic search makes it easier to identify the devices on the network.

Enter a name of up to 32 characters. A maximum of 255 devices can be registered.

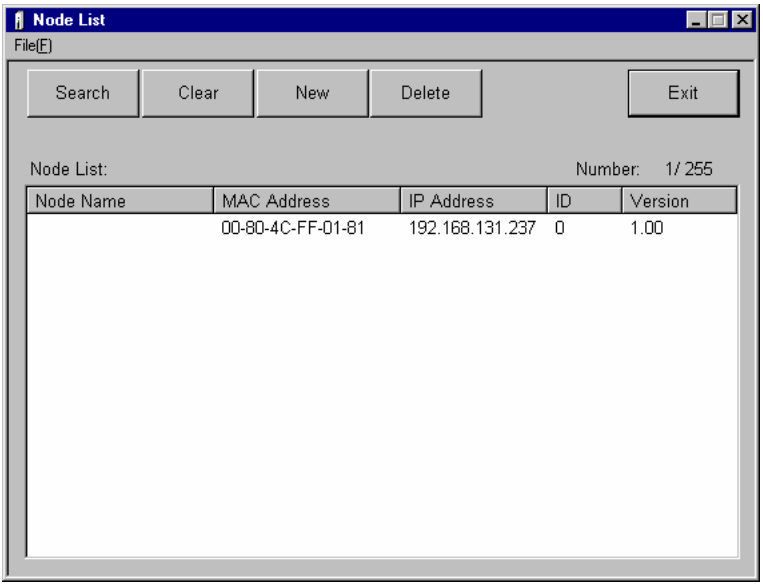


Figure 5.3. Node Registration

Button	Description
Search	This automatically detects and registers all devices connected to the same network group. If you also wish to manage devices located on the far side of an IP router, use the “New” button to register each device directly.
Clear	Deletes all registered data.
New	Registers data for a new device to be managed.
Delete	Deletes the data for the device selected in the node list
Exit	Returns to the main menu.

To modify the data displayed in the node list, double click on the node you wish to modify to open an edit window.

You can also use the “File” menu to save the current node list data to the hard disk or load a previously saved file.

Configuration

This reads and writes the settings for the device selected in the “Node Name” field.

You can set basic parameters such as the operating mode as well as SNMP and other detailed parameters.

To apply your changes, write the settings to the device and then reboot it.

You can also use the “File” menu to save the currently displayed settings to the hard disk or load a previously saved file.

Button	Description
Password	Change the password for the selected device. To change, enter the current password and new password. The new password does not become active until the device is rebooted. The password can be up to 6 alphanumeric characters and is case sensitive.
Read	Read the settings for the selected device.
Write	Write the currently displayed settings to the selected device. The new settings do not become active until the device is rebooted.
Default	Restore the factory default settings. To apply these settings, write the settings to the device and then reboot it.
Reboot	Reboot the selected device.
Exit	Returns to the main menu.

* Password input is required for the “Password”, “Read”, “Write”, and “Reboot” commands.
The factory default setting is no password. In this case, you do not need to enter anything.

Base Configuration

This sets the IP parameters and other basic operating settings for the device. You must always set the IP parameters if installing the device in an existing network.

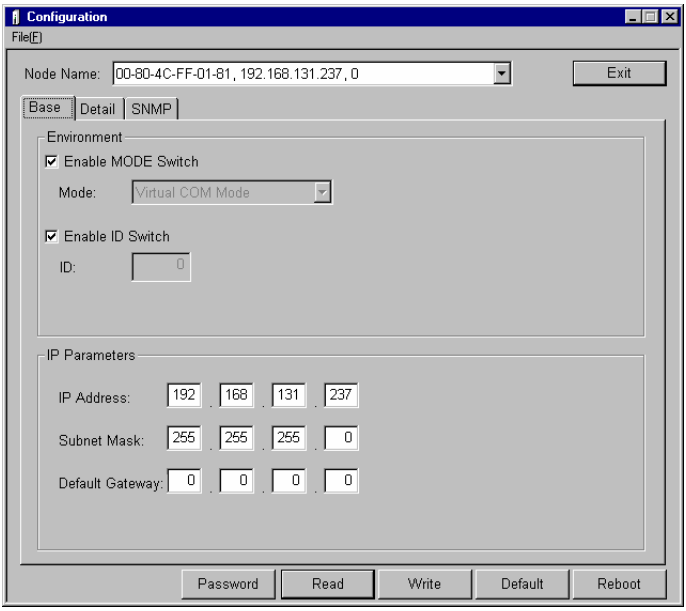


Figure 5.4. Base Configuration

<table>
<tr><th>Parameter</th><th>Memory register</th><th>Factory setting</th><th>Input range</th><th>Description</th></tr>
<tr><td>Enable MODE Switch</td><td>REG003</td><td>Enabled</td><td>Enabled/Disabled</td><td>Specifies whether to use the MODE switch settin</td></tr>
<tr><td>Mode</td><td>REG005</td><td>Switch</td><td>Through Mode / Modem Mode / Virtual COM Mode</td><td>Set the operating mode you wish to use.</td></tr>
<tr><td>Enable ID Switch</td><td>REG001</td><td>Enabled</td><td>Enabled/Disabled</td><td>Specifies whether to use the ID switch setting.</td></tr>
<tr><td>ID</td><td>REG002</td><td>Switch</td><td>0 to 254</td><td>Set the ID number to identify the device.<table><tr><th>Mode</th><th>Setting value</th></tr><tr><td>Through</td><td>Set the same ID to each device pair</td></tr><tr><td>Modem</td><td>Different ID for each device</td></tr><tr><td>Virtual COM</td><td>Not used</td></tr></table></td></tr>
<tr><td>IP Address</td><td>REG071 to REG074</td><td>10.x.x.x *1</td><td></td><td>Set the IP address mask assigned by the network administrator.</td></tr>
<tr><td>Subnet Mask</td><td>REG075 to REG078</td><td>255.0.0.0</td><td></td><td>Set the subnet mask assigned by the network administrator.</td></tr>
<tr><td>Default Gateway</td><td>REG079 to REG082</td><td>0.0.0.0</td><td></td><td>Set the IP address of the default gateway.</td></tr>
</table>

*1: Factory setting of IP Address
A unique value is assigned using the lower 3 bytes of the 6-byte Ethernet address.
(Example) Ethernet address → IP address
00-80-4C-01-02-03 → 10.1.2.3
00-80-4C-0D-0E-0F → 10.13.14.15
The initial '10' is common to all settings.

Detail Configuration

This sets the communication parameters for each operating mode. The parameters are different for each mode. See the table below for details.

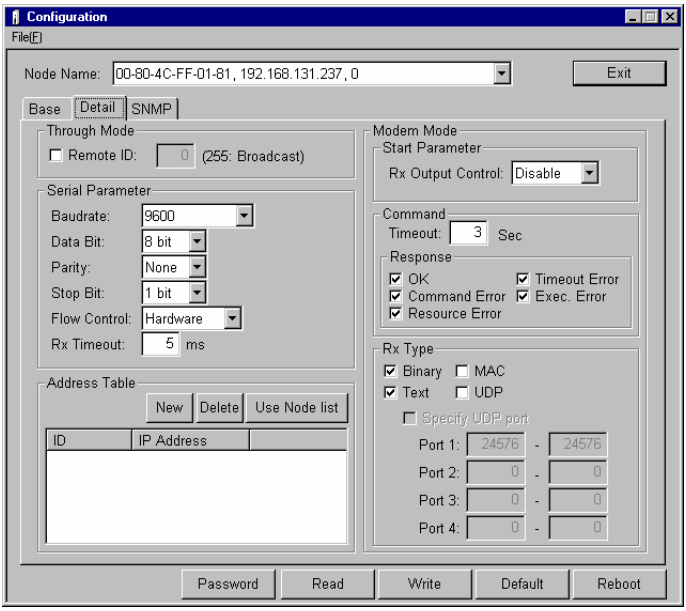


Figure 5.5. Detail Configuration

Settings for each operating mode < *1 / 2* >

Mode: (1) Through Mode, (2) Modem Mode, (3)Virtual COM Mode

○: Possible, ×: Impossible

Parameter	Memory register	Factory setting	Input range	Mode			Description
				(1)	(2)	(3)	
Remote ID	REG084	None	0 to 255/ None	O	x	x	Set the ID of the opposing device with which you are communicating. Set "255" if sending to all devices in the same network group.
Baudrate	REG006	9,600 bps	300/ 600/ 1,200/ 2,400/ 4,800/ 9,600/ 14,400/ 19,200/ 38,400/ 57,600/ 115,200/ 230,400/ 460,800/ 921,600	O	O	O	Set the communication speed of the RS-422 port. *1
Data Bit	REG008	8 bit	8 bit/7 bit	O	O	O	Set the number of data bits for the RS-422 port communication data. *1
Parity	REG009	None	None/Odd/ Even	O	O	O	Set the parity of the RS-422 port communication data. *1
Stop Bit	REG010	1 bit	1 bit/ 2 bit	O	O	O	Set the number of stop bits for the RS-422 port communication data. *1
Flow Control	REG007	Hardware	Hardware/ XON/XOFF/ None	O	O	O	Set the flow control method for the RS-422 port. *1
Rx Timeout	REG011	5msec	0 to 255	O	x	O	Set the inter-character timeout (milliseconds) for characters output to the device. If the gap between characters is longer than the time set here, the data is sent via the network port.
Address Table	IP Table 000 to 254	0.0.0.0		O	O	x	Set the IP addresses corresponding to the device IDs. Set this table if using devices on the other side of a router or if using a predefined correspondence between device IDs and IP address. *2
Rx Output Control	REG089	Prohibition	Prohibition/ Permission	x	O	x	Specify whether to output received data to the terminal from immediately after booting.
Timeout	REG086	3sec	0 to 255	x	O	x	Set the timeout time (seconds) for modem commands. If the end of a command string is not received within this time, the command is discarded. However, commands are not discarded in terminal setup mode.

Settings for each operating mode < 2 / 2 >

Mode: (1) Through Mode, (2) Modem Mode, (3)Virtual COM Mode

○: Possible, ×: Impossible

Parameter	Memory register	Factory setting	Input range	Mode (1)	Mode (2)	Mode (3)	Description
Response	REG087 to REG088	Response altogether	Response/ No response	x	O	x	Specify for each message whether or not to issue replies to modem commands. *3
Rx Type	REG090	Binary, Text	Binary/ Text/ MAC/ UDP	x	O	x	Specify the type of packets for which to output data received from the wired network to the terminal. *4 If UDP is specified, you can specify four ranges of port numbers that you wish to receive. If you wish to receive data from a specific port only rather than a range, just specify the same port number in both fields.

*1 These must match the settings for the device connected to the RS-422 port.

*2

Button	Description
New	Register a new table entry
Delete	Delete the selected table entry
Use Node list	Set the data entered using “Node Registeration”.

To change the displayed data, double click on the entry you wish to modify. This opens an edit window.

*3 Response message

Response message	Character	Description
OK	“OK”	Successful completion
Command Error	“E1”	Invalid command or parameter
Resource Error	“E2”	Unable to execute command because of insufficient internal resources.
Timeout Error	“E3”	No response from opposing device for a command that expects a response (e.g. @PIG).
Exec.Error	“E4”	An error other than those listed above occurred during command processing.

*4 Receiving packet type

Rx Type	Receivable data	Character sequence
Binary	- Data sent by @TXB command - Data sent by through mode device	“@RXB”
Text	- Data sent by @TXT command	“@RXT”
MAC	- Data sent by @TXE command - Ethernet frame received from wired network.	“@RXE”
UDP	- Data sent by @TXU command - UDP frame received from wired network. (If a UDP port is specified, the data is from that port)	“@RXU”

Note: If both MAC and UDP are enabled, data identified as UDP data is treated accordingly and other data is treated as MAC data.

SNMP Configuration

Set these settings when using the SNMP agent function.

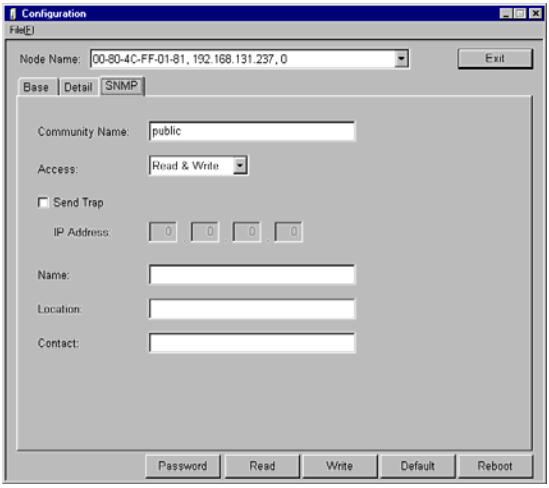


Figure 5.6. SNMP Configuration

Parameters	Factory settings	Input range	Description
Community Name	"public"	31 standard alphanumeric characters (case sensitive)	SNMP verification string. This acts like a password for access using SNMP. The SNMP administrator can use this name to access the device's MIB information.
Access	Read & Write	Read & Write / Read Only	Set access permissions for community name. Set whether "Read Only" or "Read & Write" is permitted.
Send Trap	Disabled	Enabled / Disabled	Specify whether to notify the SNMP administrator of MIB data access errors and startup (coldStart).
IP Address	With no setup		Set the IP address to which to send SNMP trap packets. Can only be set when "Send Trap" above is enabled.
Name	With no setup	A character string of up to 31 characters	Set the SNMP device name for the network device.
Location	With no setup	A character string of up to 31 characters	Set the physical location of the network device. For example, "Development Dept., 8th Floor"
Contact	With no setup	A character string of up to 31 characters	Set the administrator contact details for the network device. For example, set the network administrator's name and telephone number.

File Management

This dialog is used to get the current firmware version of devices on the network, perform firmware upgrades, and read or write the settings file.

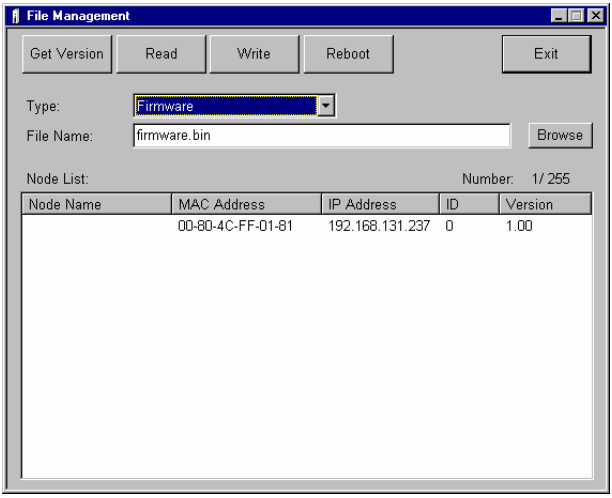


Figure 5.7. File Management

Button	Description
Get Version	Retrieves the version number from all devices connected to the same network group or from a specified device only. To get information from devices on the other side of a router, you need to specify the device explicitly. In this case, the device's IP address must have been set correctly.
Read	Read the firmware and settings file and save on the hard disk. *1
Write	Write the firmware and settings file from the hard disk to the selected device. *1
Reboot	Reboot the selected device. * You cannot perform a [Reboot] on a device in terminal setup mode. In this case, change the device ID switch back to its correct setting then turn the device power off then on again.
Exit	Returns to the main menu.
Browse	Select the file and directory name.

Type	Selected File
Firmware	File Name
Configuration File	Directory Name

*1: File name

The file name contains the lower 3 bytes of the MAC address of the selected device.

(ex.) 00-80-4C-4D-20-5E → 4D205E.TXT

Status

Reads operating information such as the environment settings and the send and receive counters from the device specified by “Node Name” and displays on the screen. The send and receive counters can also be cleared. However, data can only be cleared when scanning is stopped.

Button	Description
Exit	Returns to the main menu.
Scan Start	Reads data periodically (at the number of seconds specified by “Interval”). If “Interval” is “0”, data is read once only.
Stop	Stops reading data.

Environment

Displays the current operating environment for the specified device.

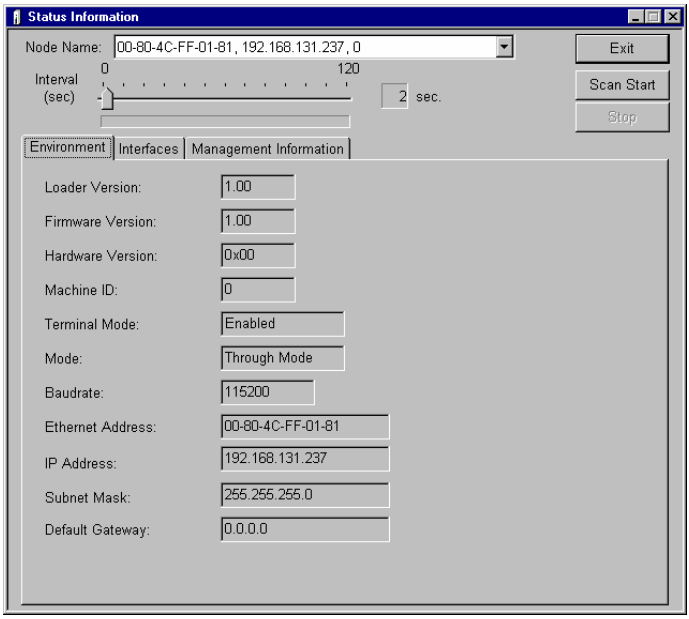


Figure 5.8. Status (Environment)

Parameters	Description
Loader Version	Version number of program for executing firmware.
Firmware Version	The version number of a firmware.
Hardware Version	The version number of a hardware.
Machine ID	The device number set up now.
Terminal Mode	Current terminal mode status
Mode	Current operating mode
Baudrate	Current RS-422 port communication speed
Ethernet Address	Ethernet address allocated to device.
IP Address	Current IP address set for device
Subnet Mask	The subnet mask set up now.
Default Gateway	The IP address of the default gateway set up now.

Interfaces

Displays data for the device's RS-422 and Ethernet interfaces including send and receive counters. The counters can be cleared when scanning is stopped.

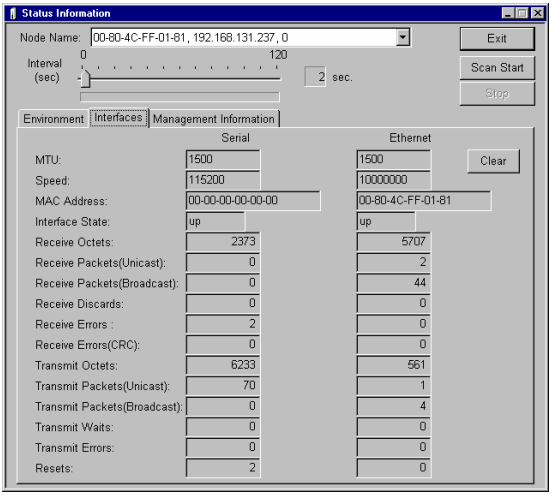


Figure 5.9. Status (Interfaces)

Parameter	Description
MTU	Maximum data size able to be sent by this interface
Speed	Transmission speed for sending data from this interface
MAC Address	MAC address assigned to this interface. No MAC address is set for the RS-422 interface.
Interface State	The state of an interface of operation. State: up — An interface is operating State: down — Not operating or no link
Receive Octets	The number of bytes of the received data.
Receive Packets	The received number of packets
Receive Discards	The number which canceled the receiving packet by the shortage of a memory etc.
Receive Errors	The number of packets which the reception error generated.
Transmit Octets	The number of bytes of the transmitted data.
Transmit Packets	The transmitted number of packets.
Transmit Waits	The number of the packet which is carrying out waiting for transmission.
Transmit Errors	The number of packets which the transmitting error generated.
Resets	The number of times which reset this interface.

Management Information

Displays the counters for sending and receiving user data and the device's internal device ID vs. IP address table. The counters and the IP address list can be cleared when scanning is stopped.

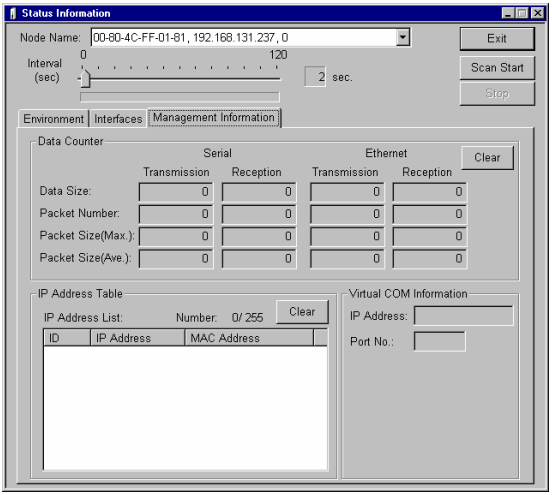


Figure 5.10. Status (Management Information)

Parameter	Description
Data Counter	Displays counters for data sent or received by user applications. Through: All data transmitted and received. Modem: Send or receive data from data section of @TXB, @TXT, @TXE, @TXU, @RXB, @RXT, @RXE, or @RXU command. Virtual COM: All data transmitted and received.
Data Size	Total number of send or receive bytes.
Packet Number	Total number of send or receive packets.
Packet Size(Max.)	Largest send or receive packet size (bytes) up to this time
Packet Size(Ave.)	Average send or receive packet size (bytes) up to this time
IP Address Table	Displays the device ID vs. IP address table set in the "Configuration" screen's "Address Table" and collected by the automatic learning function. * If duplicate information exists, the first entry to be detected is used.
ID	Device ID obtained by learning function
IP Address	IP address of device with this device ID.
MAC Address	MAC address of device with this device ID.
Virtual COM Information	Displays data used by Virtual COM Mode.
IP Address	IP address of current host PC. If the IP address is 0.0.0.0, this indicates there is no host PC.
Port No.	Port number of current host PC.

Communication Test

This performs a communication test between the device specified by “Node name” and the Windows PC connected to the device.

Echo back test

Performs an echo back test to the Windows PC connected to the RP-422(FIT)GY.

This test confirms whether the connections between the Windows PC and RP-422(FIT)GY, and between the two RP-422(FIT)GY units are working.

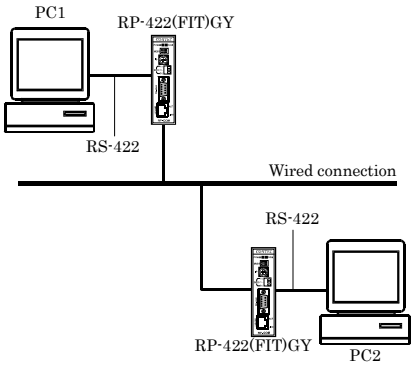


Figure 5.11.Echo Back Test (Example Configuration)

(Test procedure)

(1) Determine which PC is to send data (PC1) and which is to echo back the received data (PC2).

(2) Click the “Rx Wait” button on PC2 to wait for received data.

(3) Next, click the “Tx Start” button on PC1 to start sending data.

(4) PC2 echoes back to PC1 any data it receives via the RP-422(FIT)GY.

(5) PC1 checks whether the echoed back data is valid.

(6) PC1 increments the “In Packets” counter if the data is valid and increments the “In Errors” counter if an error occurs. If no response is received within a specified time, the “Timeout Errors” counter is incremented. In this case, you need to recheck the system configuration. Possible problems are an incorrect setup or the RS-422 cable not being connected correctly.

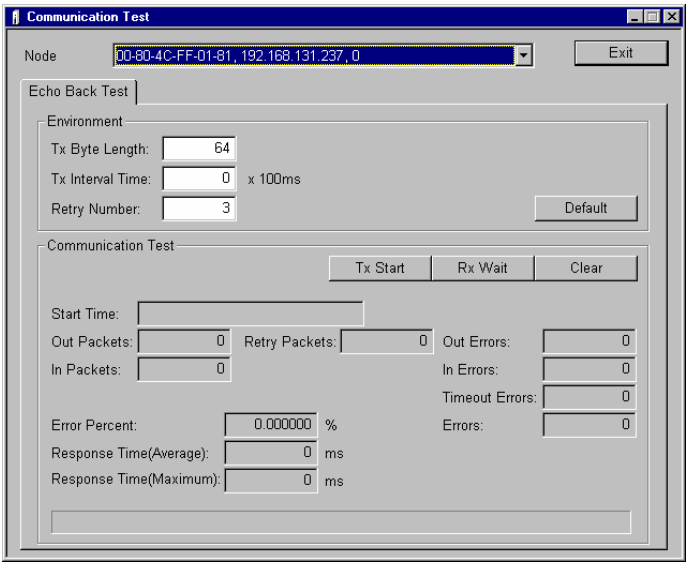


Figure 5.12. Echo Back Test

Button	Description
Exit	Returns to the main menu.
Default	Set the test parameters back to their default values.
Tx Start	Transmission of data is started.
Rx Wait	Receiving waiting of data is carried out.
Clear	Clear the counters and other displayed data.

Test environment

Parameter	Factory setting	Input range	Description
Tx Byte Length	64	64 to 1448	Set the number of bytes to send each time.
Tx Interval Time	0	0 to 65535	Set the time (unit = 100msec) between completing one send and receive operation and starting the next. If "0" is set, the next test starts immediately.
Retry Number	3	0 to 65535	If no response is received within a fixed time of data being sent, specify how many times to retry. If "0" is set, no retry is attempted.

Communication test

Parameter	Description
Start Time	Date and time when test started
Out Packets	Number of times data sent
In Packets	Number of times data received successfully
Retry Packets	Number of times data resent
Out Errors	Number of times a send error occurred
In Errors	Number of times a receive error occurred
Timeout Errors	Number of times echo back data not received within required time
Errors	Number of send errors, receive errors, and receive timeout errors.
Error Percent	Proportion of errors
Response Time (Average)	Average time from sending data until receiving echo back data (msec)
Response Time (Maximum)	Maximum time from sending data until receiving echo back data (msec)

Modem command

These commands are used to control the RP-422(FIT)GY. You can use these commands to send and receive data. The commands can be used in modem mode and in terminal mode. However, the binary data send and receive commands cannot be used in terminal mode.

Table 5.1. Command List

Command	Description
@RAR	Read all memory registers
@CAB	Clear send and receive buffers
@RBS	Read buffer status
@INI	Initialize all memory registers and reset device
@RSD	Disable output of received data
@RSE	Enable output of received data
@CRB	Clear receive buffer
@RRG	Read and set memory registers
@RST	Reset
@CTB	Clear send buffer
@VER	Read firmware version
@TXT	Transmission of text data
@TXB	Transmission of binary data
@TXE	Transmission of binary data(Ethernet frames)
@TXU	Transmission of binary data(UDP/IP frames)
@RXT	Reception of text data
@RXB	Reception of binary data
@RXE	Reception of binary data(Ethernet frames)
@RXU	Reception of binary data(UDP/IP frames)
@RXN	Receive one packet of data
@PIG	Check whether opposing station is present (using IP address)
@ECO	Check whether opposing station is present (using device ID)
@SAV	Save settings in non-volatile memory
@RES	Update memory register values (without saving in non-volatile memory)
@RRT	Read and set device ID vs. IP address table

The following pages describe the function of each command.
The symbols used in the explanations have the following meanings.

=> : Indicates input from the terminal to the device
<= : Indicates output from the device to the terminal
CR : Indicates a carriage return (0x0D)
LF : Indicates a line feed (0x0A)
“ ” : Indicates the enclosed contents are ASCII characters
( ) : Indicates input of the enclosed data. Input is mandatory.
[ ] : Indicates input of the enclosed data. Data input can be omitted.

(1) @RAR

Operation	Read the contents of all memory registers.	
Format	@RAR CR	
Response	A list of values	
	OK : Normal end	
Example	=>"@RAR" CR	Read the contents of all memory registers
	<="REG000:80H" CR LF	The register contents are output sequentially from register 000.
	<="REG001:00H" CR LF	Register values are output in hexadecimal.
	-	
	-	
	-	
	<="REG107:00H" CR LF	
	<="OK" CR LF	Normal end

(2) @CAB

Operation	Clear all send and receive buffers.	
Format	@CAB CR	
Response	Nothing	
Example	=>"@CAB" CR	Clear buffers.

(3) @RBS

Operation Read the status of internal buffers. The buffer statuses are represented by an 8-bit binary value.

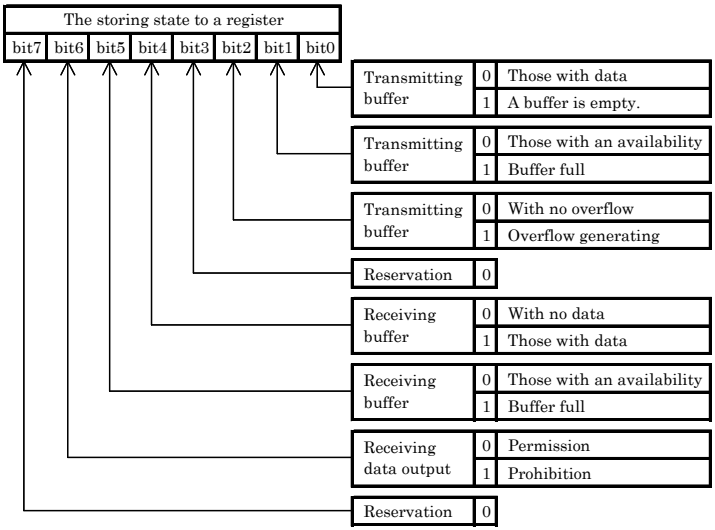


Figure 5.13. Buffer Status Representation

Format @RBS CR

Response XXXXXXXX(Status X: 0 or 1)

Example =>"@RBS" CR Read buffer status.

<="00000001" CR LF Send buffer is empty.

(4) @INI

Operation Initialize all memory registers and reset the device.

Format @INI CR

Response OK : Normal end

Example =>"@INI" CR Initialize all memory registers.

<="OK" CR LF Normal end

(5) @RSD

Operation: Disable output of received data. The default setting is that the device starts with receive data output disabled (discard data mode). Issue the @RSE command to start receiving data. Also, issue the @RSD0 command if using the @RXN1 command (described below) to receive data one packet at a time.

Format: @RSD(Mode) CR

Mode = 0 : Collect data in receive buffer while output is disabled.

Mode = 1 : Discard received data while output is disabled.

Response: Nothing

Example: =>"@RSD0" CR Disable output of received data.

(6) @RSE

Operation: Enable output of received data.
This starts outputting the data collected while data output was disabled.

Format: @RSE CR

Response: Nothing

Example: =>"@RSE" CR Enable output of received data.

(7) @CRB

Operation: Clear any received data waiting to be output.

Format: @CRB CR

Response: Nothing

Example: =>"@CRB" CR Clear any received data.

(8) @RRG

Operation: Read and/or set the value of the specified memory register. If "register number" only is specified, the current value is read. If ":setting value" is specified, the value is set in the specified register.

Format: @RRG(Register number<3 Beams>)[: Setting value< four-digit hexadecimal number >] CR

Response:
XXH : Register contents
OK : Normal end
E1 : Command error

Example:
=>"@RRG002" CR Read the contents of register REG002.
<="00H" CR LF Outputs the memory register value (00h).
=>"@RRG002:01" CR Set the value of REG002 to 01h.
<="OK" CR LF Normal end

(9) @RST

Operation	Reset the device. Used to apply new settings after saving.
Format	@RST CR
Response	OK : Normal end
Example	=>"@RST" CR Reboot the device. <="OK" CR LF Normal end

(10) @CTB

Operation	Clear any data waiting to be sent.
Format	@CTB CR
Response	Nothing
Example	=>"@CTB" CR Clear send data.

(11) @VER

Operation	Read device version number.
Format	@VER CR
Response	Loader version, Firmware version OK : Normal end
Example	=>"@VER" CR Read version number. <="Loader : 1.00" CR LF A loader version is 1.00. <="Firmware: 1.00" CR LF A firmware version is 1.00. <="OK" CR LF Normal end

(12) @TXT

Operation	Send text data to specified device. The destination device ID can be in the range 0 to 255, where 255 specifies broadcasting. The sender device ID can be in the range 0 to 255, where 255 causes the device ID of this device to be set automatically. The maximum length of data is 1448 bytes. The end of the data is indicated by a CR (carriage return).
Format	@TXT(Destination device ID<3 Beams >)(Sender device ID<3 Beams >)(Text data) CR
Response	Nothing
Example	=>"@TXT002001", "HELLO" CR Send the 5 characters "HELLO" to device ID 002.

(13) @TXB

Operation	Send binary data to specified device. The destination device ID can be in the range 0 to 255, where 255 specifies broadcasting. The sender device ID can be in the range 0 to 255, where 255 causes the device ID of this device to be set automatically. The maximum length of data is 1448 bytes and the data format is 16-bit, Little Endian.
Format	@TXB(Destination device ID<3 Beams >)(Sender device ID<3 Beams >)(Send data length)(Data) CR
Response	Nothing
Example	=>“@TXB002001”, 0x05, 0x00, “HELLO” Send the 5 bytes “HELLO” to device ID 002.

(14) @TXE

Operation	Send the input data over the wired LAN as Ethernet data. The maximum length of data is 1514 bytes and the data format is 16-bit, Little Endian. The data includes the Ethernet header.
Format	@TXE(Send data length)(Data)
Response	Nothing

Example

```
=>“@TXE”, 0x13, 0x00,                    Send data length
                                         Data
                                         Ethernet header
0x00, 0x80, 0x4C, 0x00, 0x,00, 0x02,     Address
0x00, 0x80, 0x4C, 0x00, 0x,00, 0x01,     Transmitting agency address
0x08, 0x00,                              Type field
0xAA, 0x55, 0xAA, 0x55, 0xFF             Data
                                  Send 19 bytes of data
```

(15) @TXU

Operation	Add a UDP/IP header to the input data and send over the wired LAN. This can be used to communicate with PCs or other devices that support the UDP/IP protocol. Specify the port number as a 16-bit Little Endian value. The maximum length of data is 1472 bytes and the data format is 16-bit, Little Endian.
Format	@TXU(IP address)(Address port number)(Transmitting agency port number)(Send data length)(Data)
Response	Nothing

Example

```
=>“@TXU”,   0xC0, 0xA8, 0x84, 0x01,   IP address
0x00, 0x10,                           Address port number
0x01, 0x10,                           Transmitting agency port number
0x05, 0x00,                           Send data length
0xAA, 0x55, 0xAA, 0x55, 0xFF          Data
```

Send 5 bytes of data to port 1000h on the device with IP address 192.168.132.1.

(16) @RXT

Operation	Output text data received from the wired LAN. The received data is only output if text reception is enabled in memory register (REG090). The destination device ID can be in the range 0 to 255, where 255 specifies broadcasting. The sender device ID can be in the range 0 to 254. The maximum length of data is 1448 bytes. The end of the data is indicated by a CR (carriage return).
Format	@RXT(Destination device ID<3 Beams >)(Sender device ID<3 Beams >)(Text data) CR
Example	<=“@RXT002001”, “HELLO” CR Received the text “HELLO” (5 characters) sent from device ID 001 to 002.

(17) @RXB

Operation	Output binary data received from the wired LAN. The received data is only output if binary reception is enabled in memory register (REG090). The destination device ID can be in the range 0 to 255, where 255 specifies broadcasting. The sender device ID can be in the range 0 to 254. The maximum length of data is 1448 bytes and the data format is 16-bit, Little Endian.
Format	@RXB(Destination device ID ID<3 Beams >)(Sender device ID<3 Beams >)(Receive data length)(Data)
Example	<=“@RXB002001”, 0x05, 0x00, “HELLO” Received the text “HELLO” (5 characters) sent from device ID 001 to 002.

(18) @RXE

Operation	Output Ethernet data received from the wired LAN. The received data is only output if MAC reception is enabled in memory register (REG090). The maximum length of data is 1514 bytes and the data format is 16-bit, Little Endian. The start of the data contains the Ethernet header.	
Format	@RXE(Receive data length)(Data)	
Example	<=“@RXE”, 0x13, 0x00,	Receive data length
		Data
		Ethernet header
	0x00, 0x80, 0x4C, 0x00, 0x,00, 0x02,	Address
	0x00, 0x80, 0x4C, 0x00, 0x,00, 0x01,	Transmitting agency address
	0x08, 0x00,	Type field
	0xAA, 0x55, 0xAA, 0x55, 0xFF	Data
		Receive 19 bytes of data

(19) @RXU

Operation Output UDP/IP data received from the wired LAN.
The received data is only output if UDP reception is enabled in memory register (REG090). If a UDP port is specified, only data received from that port is output.
Specify the port number as a 16-bit Little Endian value.
The maximum length of data is 1472 bytes and the data format is 16-bit, Little Endian.

Format @RXU(Destination IP Address)(Sender IP Address)
(Destination port number)(Sender port number)(Receive data length)(Data)

Example

<="@RXU", 0xC0, 0xA8, 0x84, 0x01,	IP address
0xC0, 0xA8, 0x84, 0x02,	Sender IP Address
0x00, 0x10,	Destination port number
0x01, 0x10,	Sender port number
0x05, 0x00,	Receive data length
0xAA, 0x55, 0xAA, 0x55, 0xFF	Data

Received data sent from the device with IP address 192.168.132.2 to port 1000h on the device with IP address 192.168.132.1.

(20) @RXN

Operation Receive one packet of data.

If using the @RXN1 command to receive packets one at a time, first use the @RSD0 command to disable output of received data and change to the mode whereby data is collected in the receive buffer.

Issuing the @RXN1 command outputs any received data already in the buffer. If no data is waiting, data is output when it is received. After receiving data, issue the @RXN1 command again to received the next data packet.

While waiting to receive data after issuing a @RXN1 command, you can issue @RXN0 to cancel data reception. Changing to terminal setup mode, or issuing the @CAB or @CRB command also cancels data reception.

Format @RXN(Mode) CR

Mode = 0	: Cancel waiting for data reception
Mode = 1	: Receive one packet of data

Example

=>"@RSD0" CR	Disable output of received data.
=>"@RXN1" CR	Get received data.

<="@RXB002001", 0x05, 0x00, "HELLO"
Received the data "HELLO" (5 characters) sent from device ID 001 to 002.

(21) @PIG

Operation Executes a Ping command for the device with the specified IP address.

Format @PIG(IP address) CR

Response
- OK : Normal end
- E1 : Command error
- E2 : Insufficient resources
- E3 : Timeout error
- E4 : Transmitting error

Example
=>"@PIG192.168.132.1" CR Execute a Ping command for the device with IP address 192.168.132.1.
<="OK" CR LF Normal end

(22) @ECO

Operation Executes a Ping command for the device with the specified device ID.

Format @ECO(Destination device ID) CR

Response
- OK : Normal end
- E1 : Command error
- E2 : Insufficient resources
- E3 : Timeout error
- E4 : Transmitting error

Example
=>"@ECO001" CR Execute a Ping command for the device with device ID 001.
<="OK" CR LF Normal end

(23) @SAV

Operation Save the current contents of the memory registers to non-volatile memory.

Format @SAV CR

Response
- OK : Normal end
- E4 : Write-in error

Example
=>"@SAV" CR Save to non-volatile memory
<="OK" CR LF Normal end

(24) @RES

Operation	Enable the values of the registers indicated by a “*” next to the register number in the register list.	
Format	@RES CR	
Response	OK :	Normal end
	E4 :	Initialization error
Example	=>”@RES” CR	Enable settings
	<=”OK” CR LF	Normal end

(25) @RRT

Operation	Reads and/or sets the table that defines the correspondence between device ID and IP address. This is required if you wish to communicate with devices on the other side of an IP router. Also, even if the IP address for a device ID is not registered, the IP address is obtained automatically by the learning function if communication with the device occurs. These learnt values can also be referenced.	
Format	(Setup method)	
	@RRT(Device ID) : (IP address) CR	
	(Getting method)	
	@RRT(Device ID) CR	
Response	OK :	Normal end
	E1 :	Command error
Example	(Setup)	
	=>”@RRT001:192.168.132.1” CR	Set 192.168.132.1 to the device ID 001.
	<=”OK” CR LF	Normal end
	(Getting)	
	=>”@RRT001” CR	Read the Device IP address for the Device ID001.
	<=”192.168.132.1” CR LF	The IP address is 192.168.132.1. (“0.0.0.0” is output if no IP address is registered.)

Setup of a virtual COM driver

Correspondence OS

The virtual COM driver can be used on Windows Vista, XP, 2000, Me, 98 Second Edition, 98 etc.

For details, read Help supplied on the CD-ROM.

Cautions on Use

Take note of the following points when using the virtual COM driver:

The virtual COM driver uses the F&eIT protocol.

The TCP/IP protocol must be installed as part of the network configuration.

The RP-422(FIT)GY must already be running before you start the application that is to use the virtual COM port.

Communications may not work correctly in some cases, depending on the application that is to use the virtual COM port and the device connected to the COM port on the RP-422(FIT)GY.

Installing the Driver in Windows XP

Installation procedure

(1) Select [Add Hardware] from [Control Panel].

(2) This starts the [Add Hardware Wizard]. Click [Next>] as instructed on the screen.

(3) In the [Is the hardware connected?] dialog box, check the [Yes, I have already connected the hardware] button and select [Next].

(4) In the [The following hardware is already installed on your computer] dialog box, check [Add a new hardware device] in the [Installed hardware] list and select [Next].

(5) In the [The wizard can help you install other hardware] dialog box, check the [Install the hardware that I manually select from a list (Advanced)] button and select [Next].

(6) In the [From the list below, select the type of hardware you are installing] dialog box, check [Ports (COM & LPT)] and select [Next].

(7) In the [Select the device driver you want to install for this hardware.] dialog box, select [Have Disk].

(8) In the [Floppy Install] dialog box, select [Browse], specify the folder containing the virtual COM driver for Windows Vista and XP, then select the [OK] button. Use the virtual COM driver on the floppy disk supplied with the unit or the latest version downloaded from the CONTEC web site.

(9) In the [Models] screen, check [F&eIT Virtual COM Port] and select [Next].

(10) When a warning message appears, select [Continue].

(11) In the [Completing the Add Hardware Wizard] dialog box, select [Finish].

⚠ CAUTION

- The wizard may stop after file copying in steps (9) to (11) is completed. If this occurs and you abort Windows to restart, the COM port name may not be displayed in Device Manager invoked from [System Properties].
- If a symptom like this occurs, uninstall the virtual COM driver once, then install it in safe mode.

Setup

(1) Select [Device Manager] from [System Properties].

(2) Double click on [Ports(COM&LPT)] and select [Properties] for the virtual COM device you wish to setup.

(3) Select [Port Settings] from [F&eIT Virtual COM Port (COMx) Properties].

(4) Set the required settings, then click [OK].

⚠ CAUTION

- Always set an IP address
- Set the IP address of the target RP-422(FIT)GY in the [Port Settings] IP address field

Uninstallation procedure

(1) Start Windows in safe mode. To Start Windows in safe mode, reboot the PC and begin tapping the F8 key as soon as the BIOS has finished loading until the Windows Advanced Options menu appears. Select “Safe mode” from the menu.

(2) Select [Device Manager] from [System Properties].

(3) Double click on [Ports(COM&LPT)] and select [Uninstall] for the virtual COM device you wish to uninstall.

Please read Readme-file supplied on the disk for the installations and uninstallations other than Windwos XP.

6. SNMP Agent Functions

This chapter describes the SNMP functions of this product, and explains how they can be built in using the SNMP Manager SNMPc by CONTEC.

SNMPc Overview

SNMPc is network control software for SNMP that runs on Windows and controls all network devices that have SNMP agent functions. SNMPc can be used to perform the following control functions.

- Monitoring unit startup status
- Monitoring port operating status
- Indicating MIB information
- Displaying log files of traps, events, etc.

For instructions on installing and operating SNMPc, refer to the SNMPc documentation. Note that a bitmap display of this product can be displayed on SNMPc by installing it from the floppy disk provided with this product.

MIB Support

This product provides MIB support for MIB-II (RFC1213), bridge MIB (RFC1493), and private MIB. Support is provided for the following group names.

Table 6.1. Group Names

MIB Group name	Description
MIB-II	
system	Information related to AP, including AP control name, operating time etc.
interfaces	Basic information related to the physical interface layer, including MAC address etc.
at	Information corresponding to the ARP cache
ip	Information related to IP protocol, including IP address information etc.
icmp	Information related to ICMP protocol, including ICMP message TX/RX count, etc.
udp	Information related to UDP protocol, including UDP message TX/RX count, etc.
snmp	Information related to SNMP, including SNMP message count, etc.
Private MIB	
ethercomEnvironment	Operating environment information.
ethercomStatusInfo	Status information including LED, DIP switch status.
ethercomPriSerInterfaces	Interface data for RS-422 port
ethercomPriSerDataCntTable	Counter table for user data
ethercomPriSerAddrTable	Device ID vs. IP address conversion table
ethercomPriEthInterfaces	Interface data for Ethernet port

Control Using SNMPc

Install SNMPc on a personal computer in the network to which this product is connected. Read the SNMPc manual carefully.

Once installation is complete, you can operate the PC on which SNMPc is installed as a network manager, analyzing network status and error information from this device as shown below.

Also, you can install the Utility Disk provided with this product on SNMPc, to display information about this product in graphic form as shown below.

⚠ CAUTION

In order to control this product, its IP address and community name must be entered accurately in the Settings.

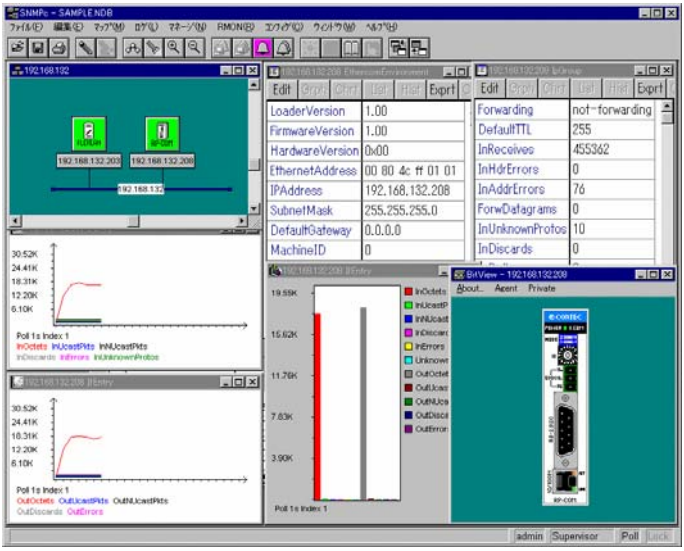


Figure 6.1. Settings

Building-in to SNMPc

Follow these steps to install SNMPc Ver. 4.

(1) Start the SNMPc Setup program.

To start SNMPc Ver. 4, select [Start] – [SNMPc 4.0] – [Setup]. After startup, verify the user registration information.

(2) Insert the Maintenance Tools floppy disk provided with this product into the floppy disk drive. Enter the floppy disk drive path name followed by SNMPc.4\, and click 'OK.'

Example: If the floppy disk drive is the A: drive, enter A:\SNMPc.4\.

(3) Select [CONTEC RP-422(FIT)GY], and click [OK] to start installation.

(4) When the following message appears, click [No] to exit the program.

[Do you want to install additional vendors?]

MIB Database Updates

After installing a new vendor, you will have to update the MIB database the next time SNMPc is started.

Follow these steps to update the MIB database. In this description we use 'SNMPc Ver.4' as an example.

(1) Start SNMPc.

To start SNMPc Ver. 4, select [Start] – [SNMPc 4.0] – [SNMPc].

(2) Click [Yes] to update the MIB database.

(3) When you are finished updating the MIB database, click [OK]. The build-in to SNMPc is not complete.

7. Troubleshooting

This chapter describes common problems that may occur with this product and what to do about them. If any problems occur that are not described here, check to confirm that the re-occur, then contact the store where you purchased the product, or the CONTEC information center.

When Communication Fails

Check hardware

- Check that the LAN cables are connected correctly.
- Check that the RS-422 cables are connected correctly.

Check software

- Was the unit started with the ID switch set to “F”?
- Is the ID switch set correctly (0 to E)?
- Is the MODE switch set correctly?
- Is the baud rate set correctly?
- Is the operating mode set correctly?
- Are the IP address and subnet mask set correctly?

When SNMP Connections Fail

- It is possible that the device cannot locate a control parameter, or that a private MIB has not been compiled. See Chapter 6.
- If MIB settings have not been made, the correct community name may not have been entered. Be sure the community name setting agrees with the network manager's setting.
- Check the SNMP settings that are being used.

When the RP-422(FIT)GY Will Not Start

Check the power LED

- Be sure the power LED is on. If not, check that the AC adapter, power supply connector, and mains power plug are connected correctly.
- If the POWER LED does not illuminate within 3 minutes of turning on the power or resetting via the utility software, first check whether the device ID is set to “F”.
- If the device ID is set to “F”, change to a value other than “F”, then restart.
- If the device ID is not set to “F”, it is possible that the firmware is faulty.
  In this case, use the utility software to update the firmware.

If your problem cannot be resolved

Contact your retailer.

8. Appendix
System Reference

Product Specifications

Table 8.1. Functional Specification

Specification		RP-422(FIT)GY
RS-422 unit	Serial standard	RS-422
	Data transmission speed	300 to 921,600bps
Wired LAN unit	Ethernet standard	IEEE802.3u, IEEE802.3
	Data transmission speed	10/100Mbps
	Access method	CSMA/CD
	Communication system	Half Duplex / Full Duplex
	Number of ports	1(10BASE-T/100BASE-TX)
Supply voltage		5.0VDC ± 5% (An AC adapter is provided)
Current consumption		0.5A(Max.)
Dimensions (mm)		25.2(W) x 64.7(D) x 94.0(H) (Not including protruding parts.)
Weight		100g

Table 8.2. Installation Environment Conditions (Environment Specifications)

Parameter		Requirement description
Operating temperature		0 to 50°C
Storage temperature		-10 to 60°C
Operating humidity		10 to 90%RH (No condensation)
Floating dust particles		Not extreme
Corrosive gases		None
Line-Noise resistance	Line-noise *	AC line/2kV, Signal line/1kV (IEC1000-4-4Level 3, EN61000-4-4Level 3)
	Static electricity resistance	Contact discharge/4kV (IEC1000-4-2Level 2, EN61000-4-2Level 2)
		Atmospheric discharge/8kV (IEC1000-4-2Level 3, EN61000-4-2Level 3)
Vibration resistance	Sweep resistance	10 to 57Hz/semi-amplitude 0.15mm, 57 to 150Hz/2.0G
		80minutes each in X, Y, and Z directions (JIS C0040-compliant, IEC68-2-6-compliant)
Impact resistance		15G, half-sine shock for 11ms in X, Y, and Z directions (JIS C004-compliant, IEC68-2-27-compliant)
Grounding		Class D grounding (previous class 3 grounding)

* : At the time of appending AC adapter use

Table 8.3. Software Specifications

Specification	RP-422(FIT)GY
Protcols	IP(RFC 791), ICMP(RFC 792), UDP(RFC 768), ARP(RFC 826), SNMP (RFC 1157), MIB II (RFC 1213)

Table 8.4. AC Adapter Environmental Conditions (Environmental Specs)

Specification	RP-422(FIT)GY(Accessory)
AC supply voltage	100 to 240VAC 0.3A(Max.)
AC supply frequency	50 to 60Hz
DC supply voltage	5VDC ± 5% 2.0A(Max.)
Operating temperature	0 to 40°C
Operating humility	10 to 90%RH (non condensation)
Airborne dust	Not extreme
Corrosive gases	None

External Dimensions

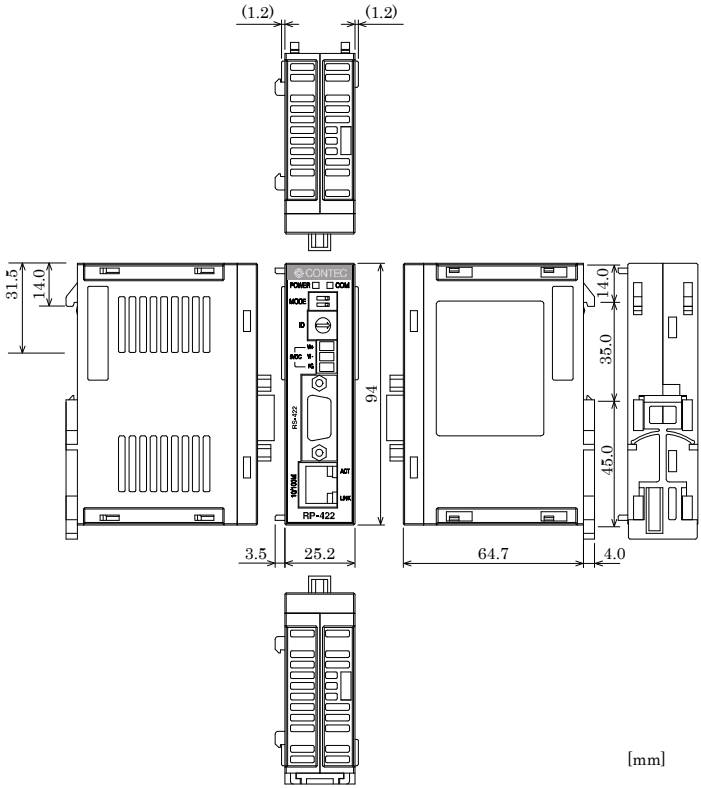


Figure 8.1. External Dimensions

Memory register

The memory registers are used to store the operating mode and communication parameter settings for the device. These registers can be used in modem mode and terminal mode. An "*" next to the register number indicates registers that require settings to be reinitialized either using the @RES command or by saving the settings then rebooting.

Table 8.5. Memory Register List < 1 / 2 >

Register number	Function	Access	Initial value	Supplement
REG000	MODE SW	R	MODE SW	MODE SW setting
*REG001	ID SW setting	R/W	ID SW enabled	0: ID SW enabled 1: ID SW disabled
*REG002	Device ID	R/W	ID SW	0 to 254
*REG003	MODE SW setting	R/W	MODE SW enabled	SW setting is enabled or disabled (excludes initialization) 0: MODE SW enabled 1: MODE SW disabled
REG004	Terminal setting mode	R/W	MODE SW setting	0: Disabled 1: Terminal setting mode
*REG005	Mode	R/W	MODE SW setting	0: Through mode 1: Modem mode 2: Virtual COM mode
*REG006	Baudrate	R/W	MODE SW setting	0: 300 1: 600 2: 1,200 3: 2,400 4: 4,800 5: 9,600 6: 14,400 7: 19,200 8: 38,400 9: 57,600 10: 115,200 11: 230,400 12: 460,800 13: 921,600
*REG007	Flow control	R/W	Hardware control	0: Hardware control (RTS/CTS) 1: None 2: Hardware control (XON/XOFF)
*REG008	Data bit	R/W	8bit	0: 8bit 1: 7bit
*REG009	Parity	R/W	None	0: None 1: Odd parity 2: Evevn parity
*REG010	Stop bit	R/W	1bit	0: 1bit 1: 2bit
REG011	Rx timeout	R/W	5msec	0 to 255
REG065 and above	MAC address	R	00.80.4C. **.**.**	Device-specific data (Cannot be modified)
*REG071 and above	IP address	R/W	10.**.**.**	Initial values are generated automatically from the MAC address.
*REG075 and above	Subnet mask	R/W	255.0.0.0	
*REG079 and above	Default gateway	R/W	0.0.0.0	
*REG084	Opposing station setting	R/W	Same device ID	0: Connect to device with same device ID. 1: Connect to device with specified device ID. Enable through mode only

Table 8.5. Memory Register List < 2 / 2 >

Register number	Function	Access	Initial value	Supplement
*REG085	Device ID of opposing station	R/W	0	0 to 255 Enable through mode only (255: Broadcasting)
REG086	Command input timeout	R/W	3sec	Inter-character monitor time
REG087	Response OK ("OK")	R/W	Response	0: No response 1: Response
REG088	Response error ("E?")	R/W	Response altogether	11111111B E1 to E8
*REG089	Start with receive data output enabled	R/W	Output prohibition	0: Output prohibition 1: Output permission
REG090	Reception type	R/W	00000011B	0bit: Binary 1bit: Text 2bit: MAC 3bit: UDP Initial value = "Do not receive MAC or UDP"
REG091	UDP port setting	R/W	Disabled	0: Disabled 1: Enabled Only applies when UDP is set as the type of data to receive.
REG092 and above	Minimum value of UDP port 1	R/W	6000h	0: With no setup
REG094 and above	Maximum value of UDP port 1	R/W	6000h	Note that 5000h to 500Fh are reserved and cannot be used. If specifying the UDP number during operation, change the reception type to "do not receive UDP".
REG096 and above	Minimum value of UDP port 2	R/W	0000h	
REG098 and above	Maximum value of UDP port 2	R/W	0000h	
REG100 and above	Minimum value of UDP port 3	R/W	0000h	
REG102 and above	Maximum value of UDP port 3	R/W	0000h	
REG104 and above	Minimum value of UDP port 4	R/W	0000h	
REG106 and above	Maximum value of UDP port 4	R/W	0000h	

Note: In the "Access" column, "R" indicates read

Table 8.6. Device ID vs. IP Address Table (For Communication via a Router Only)

Device ID	Description	Access	Initial value	supplement
000 to 254	IP address	R/W	000.000.000.000	Device ID and IP address

Note: In the "Access" column, "R" indicates read and "W" indicates write.
This table defines the correspondence between device ID and IP address.
It is required for communication with devices on the other side of an IP router.
It is not required for communication within the same network group.

RP-422(FIT)GY

User's Manual

CONTEC CO., LTD.

November 2007 Edition

3-9-31, Himesato, Nishiyodogawa-ku, Osaka 555-0025, Japan
Japanese http://www.contec.co.jp/
English http://www.contec.com/
Chinese http://www.contec.com.cn/

No part of this document may be copied or reproduced in any form by any means without prior written consent of CONTEC CO., LTD. [11192007]

[08252004]
[11192007_rev3]

Management No. A-46-666
Parts No. LYBS993